

Report for 2004DE40B: Undergraduate Internship: Monitoring and Assessing the Nutrient Status and Overall Health of Freshwater Wetlands

- Water Resources Research Institute Reports:
 - Vasilas, Bruce; Carol Carlson, 2005, Monitoring and Assessing the Nutrient Status and Overall Health of Freshwater Wetlands, Delaware Water Resources Center, University of Delaware, Newark, DE 9 pages.

Report Follows

Undergraduate Internship Project #2 of 9 for FY04

Carol Carlson's project is "Monitoring and Assessing the Nutrient Status and Overall Health of Freshwater Wetlands". Her advisor is Dr. Bruce Vasilas of the University of Delaware (UD) Department of Plant and Soil Sciences, and the project is co-sponsored by the **UD Department of Plant and Soil Sciences** and the **Delaware Water Resources Center**.

"Through my internship with DWRC I have been made aware of the different aspects of monitoring and assessing wetlands. I have had the opportunity to participate in soil descriptions at sites that differed in topography, land use, and surrounding geography. I have also been involved in collecting water samples to measure phosphorous and nitrogen levels as well as used equipment to measure soil water temperature and dissolved oxygen. It has been a great learning experience."
– Carol Carlson

Abstract

Under the Clean Water Act, states are required to monitor waters including wetlands for purposes of compliance with water quality standards. Our objectives were as follows: (I) to establish baseline levels for nitrogen and phosphorous (N,P), (II) to determine the relationship between disturbance and nutrient enrichment, (III) to determine the relationship between water quality, and biotic and abiotic characteristics of wetlands, and (IV) to identify robust indicators of nutrient enrichment and overall ecological health for potential rapid assessment procedures.

These objectives are being carried out over a three-year period. Six Piedmont freshwater slope wetlands were selected to include a range of hydrologic conditions and anthropogenic disturbances. Sampling wells were placed in the wetland and readings for dissolved oxygen and temperature were taken bimonthly from February - July and monthly from August - January. The wetland samples were filtered and tested for N and P levels. Bio-assessment and rapid assessment procedures in and surrounding the wetlands were implemented as well. Based on these data and information previously collected from hydroperiods of representative sites, our results show: Dissolved oxygen levels followed the expected trend of lower levels at warmer water temperatures and higher levels at cooler water temperatures. Expected species of salamanders were found at four of the sites with the greatest number and frequency at the Willis Farm site and the fewest number and frequency at the Stroud site. Hydroperiods did not always follow the expected pattern of a lower water table during the growing season and a higher water table in the winter months. Many factors are involved in the water table level such as topography, presence of seeps, piled up plant matter, pooling, infiltration rates, and soil texture and structure, all of which influence water table level. Nitrogen levels also did not follow expected trends of lower values in the growing season and higher values in the winter months for many of the same reasons listed above as well as effects from surrounding land use.